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(54) Double current collector negative electrode design for alkali metal ion electrochemical cells

(57) A new sandwich negative electrode design for a secondary cell is provided comprising a "sacrificial" alkali metal along with a carbonaceous anode material. In the case of a hard carbon anode material, the sacrificial alkali metal is preferably lithium and is sized to compensate for the initial irreversible capacity of this anode material. Upon activating the cells, the lithium metal automatically intercalates into the hard carbon anode material. That way, the sacrificial lithium is consumed and compensates for the generally unacceptable irreversible capacity of hard carbon. The superior cycling longevity of hard carbon now provides a secondary cell of extended use beyond that know for conventional secondary cells having only graphitic anode materials.

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PARTIAL EUROPEAN SEARCH REPORT

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

Application Number EP 01 12 7533

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
A	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 14, 22 December 1999 (1999-12-22) -& JP 11 246209 A (OSAKA GAS CO LTD), 14 September 1999 (1999-09-14) * abstract *	1,15,19	H01M4/02 H01M4/06 H01M4/36 H01M6/16
A	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 12, 3 January 2001 (2001-01-03) -& JP 2000 260475 A (SANYO ELECTRIC CO LTD), 22 September 2000 (2000-09-22) * abstract *	1,15,19	
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A	US 5 516 340 A (TAKEUCHI ET AL) 14 May 1996 (1996-05-14)		H01M

INCOMPLETE SEARCH

The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.

Claims searched completely :

Claims searched incompletely :

Claims not searched :

Reason for the limitation of the search:

see sheet C

Place of search	Date of completion of the search	Examiner
The Hague	4 July 2005	Gregg, N

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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INCOMPLETE SEARCH SHEET C

Application Number
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Claim(s) searched incompletely:
1-20

Reason for the limitation of the search:

Present claims 1, 15 and 19 relate to an extremely large number of possible compounds for short circuited andoe active material. Support within the meaning of Article 84 EPC and/or disclosure within the meaning of Article 83 EPC is to be found, however, for only a very small proportion of the compounds claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those citing actual cathodic materials or structures (such as in claims 2 or 3).

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 01 12 7533

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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